CLAIMS

1. A polyethylene wax defined by the following features (i) to (iv):

(i) said polyethylene wax is an ethylene homopolymer or a copolymer of ethylene and at least one olefin selected from α-olefins of 3 to 20 carbon atoms,

(ii) a ratio (Mw/Mn) of the weight-average molecular weight (Mw) to the number-average molecular weight (Mn), as measured by gel permeation chromatography (GPC), is in the range of 1.7 to 4.0,

(iii) the softening point is not higher than 125°C, and

(iv) the penetration hardness is not more than 15 dmm.

2. The polyethylene wax as claimed in claim 1, which is a copolymer of ethylene and at least one olefin selected from α-olefins of 3 to 20 carbon atoms and has a ratio (Mw/Mn) of a weight-average molecular weight (Mw) to a number-average molecular weight (Mn), as measured by gel permeation chromatography (GPC), of 2.6 to 4.0, a softening point of not higher than 110°C, a penetration hardness of not more than 15 dmm, an intrinsic viscosity [η], as measured in decalin at 135°C, of 0.15 to 0.50

dl/g, a ratio (Mz/Mw) of a z-average molecular weight (Mz) to a weight-average molecular weight (Mw), as measured by gel permeation chromatography (GPC), of 1.5 to 2.0, a density of 880 to 910 kg/m^3 and an acetone extraction quantity of not more than 6% by weight, wherein the softening point (Ts (°C)) and the penetration hardness (Y (dmm)) satisfy the following relationship (I):

$$-0.53Ts + 62 > Y > -0.53Ts + 53 \qquad (I).$$

3. The polyethylene wax as claimed in claim 1, which is an ethylene homopolymer or a copolymer of ethylene and at least one olefin selected from α-olefins of 3 to 20 carbon atoms and has a ratio (Mw/Mn) of a weight-average molecular weight (Mw) to a number-average molecular weight (Mn), as measured by gel permeation chromatography, of 1.7 to 3.3, a softening point of 88 to 125°C, a penetration hardness of not more than 7 dmm and an intrinsic viscosity [η], as measured in decalin at 135°C, of 0.05 to 0.20 dl/g.

4. The polyethylene wax as claimed in claim 1, which is prepared by the use of a metallocene catalyst.

5. A lost wax composition for precision casting, comprising a polyethylene wax defined by the following features (i) to (iv):

(i) said polyethylene wax is an ethylene homopolymer or a copolymer of ethylene and at least one olefin selected from α-olefins of 3 to 20 carbon atoms,

(ii) a ratio (Mw/Mn) of the weight-average molecular weight (Mw) to the number-average molecular weight (Mn), as measured by gel permeation chromatography (GPC), is in the range of 1.7 to 4.0,

(iii) the softening point is not higher than 125°C, and

(iv) the penetration hardness is not more than 15 dmm.

6. The lost wax composition for precision casting as claimed in claim 5, wherein the polyethylene wax is an ethylene homopolymer or a copolymer of ethylene and at least one olefin selected from α-olefins of 3 to 20 carbon atoms and has a ratio (Mw/Mn) of a weight-average molecular weight (Mw) to a number-average molecular weight (Mn), as measured by gel permeation chromatography, of 1.7 to 3.3, a softening point of 88 to 125°C, a penetration hardness of not more than 7 dmm and an

intrinsic viscosity [η], as measured in decalin at 135°C, of 0.05 to 0.20 dl/g.

7. The lost wax composition for precision casting as claimed in claim 5, wherein the content of the polyethylene wax is in the range of 5 to 50% by weight.

8. The lost wax composition for precision casting as claimed in claim 5, wherein the polyethylene wax has an acid value of 0.5 to 5.0 KOH·mg/g.

9. A method for forming a model for precision molding, using the lost wax composition for precision casting of claim 5.